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It will be necessary for our colleges to offer a more attractive career to their professors, especially in the enlargement of opportunity for individual freedom of intellectual effort. This is more important than any increase in salaries, for the ablest men strive to serve mankind rather than to seek money. It is true, as President Eliot states, that "in the United States the profession of teaching and scientific research offers absolutely no money prizes." The middle ages looked complacently upon the beggar student and this spirit survives to-day in many a college trustee's easy tolerance of the poor salaries paid to famous teachers whose names will be remembered as leaders of our race long after his own has perished; but insufficient though their material support may be, it is of vastly more importance for us to improve their *opportunities* to be useful in respect to their peculiar individual abilities. This omnipotence of the effective individual is the key-note of the success of the German university system. German students seek individual professors—whereas ours commonly enter college ignorant of the names and even heedless of the scholarly reputations of their teachers.

The most serious effects of a bad system are often the most obscurely seen and difficult to detect, and it may safely be said that the most pernicious result of the treatment now accorded him who devotes his life to pure science is that it deters many an able young man from entering upon a career of research. When he leaves the university he elects to follow law or commercial pursuits, and hopes thereby to gain the competence which will enable him to reenter the ranks of men of science with all the great advantages of personal independence; but the habits of another life overwhelm him—he never returns and is lost to science.

ALFRED GOLDSBOROUGH MAYER

*THE SHEFFIELD MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE*¹

ON the last day of this month the British Association for the Advancement of Science will begin at Sheffield its eightieth annual meeting. Only once before in its history has the association met there. That was in 1879, when Professor G. J. Allman, M.D., F.R.S., the then president of the Linnæan Society, assumed the presidency of the association in succession to Mr. W. Spottiswoode, and the list of sectional presidents included such well-known names as Mr. G. Shaw Lefevre (economic science), Professor Dewar (chemistry), Mr. Clements Markham (geography) and Professor St. George Mivart (biology).

The extent to which the problems of to-day were even then attracting attention is shown by the subjects of the evening lectures, it being recorded in the annals of the association that Mr. W. Crookes, F.R.S., discoursed on Radiant Matter, Mr. W. E. Ayrton lectured to the operative classes on "Electricity as Motive Power," and Professor E. Ray Lankester, F.R.S., discussed the question of degeneration. But though the former Sheffield meeting fully sustained the high reputation of the association on its scientific side, only 1,404 members and associates were attracted to the meeting. A smaller attendance has been recorded at only seven meetings during the past half century. The forthcoming meeting ought to bring together a much larger number of members and associates. The presidential addresses, the lectures, discussions and many of the individual papers promise to be of great interest and

¹The London *Times* prints annually a forecast of the meetings of the British Association for the Advancement of Science, compiled with the cooperation of the officers of the association. We reprint this sketch as the best available account of the forthcoming meeting.

value; the social functions that have been arranged are both numerous and attractive, and show that the association is assured of the same generous measure of hospitality and entertainment in Sheffield that it has received elsewhere in its peripatetic career.

Sheffield has gone ahead by leaps and bounds since it was last visited by the British Association. In 1879 its population was about a quarter of a million; now the population is estimated to be nearly twice as large, and the municipal area is the largest in the kingdom. During the interval Sheffield has become a county borough (in 1888), and in 1893 the jubilee of its corporation was made notable by its creation as a city. Five years ago its university was established by royal charter, the opening ceremony being performed by King Edward VII., who was accompanied by Queen Alexandra. The new university library, the gift of a local benefactor, Mr. W. Edgar Allen, is just a year old, and was opened by their present majesties, King George and Queen Mary, while still Prince and Princess of Wales. It is interesting to note that Firth College, out of which the university has developed, was established in the year of the association's last visit to Sheffield. The town hall, erected at a cost of £182,000, is only one of many other handsome public buildings which have come into existence in the past thirty years, and have done away with much of the ground for Horace Walpole's reproach that Sheffield was "one of the foulest towns of England in the most charming situation." The city is still, of course, essentially a great manufacturing center, and from the picturesque point of view suffers from the defects of its industrial activity; but the proportions of its streets and the character of its buildings have been vastly improved in recent years, and the Sheffield

of to-day is not behind any of its northern neighbors in respect of municipal enterprise. And though the modern development of its iron and steel industries is the most distinguishing feature of the city, Sheffield is not without historical interest. The Cutlers' Company has enjoyed legal recognition for nearly three hundred years, its charter of incorporation dating back to 1624, and there is no doubt that it existed long before it was incorporated, just as Sheffield itself was certainly famous in the middle ages for its cutlery—witness "The Canterbury Tales," in which the Reeve says of the Miller in his tale: "A Sheffield thwitel baar he in his hose."

By the courtesy of the Cutlers' Company the reception-room and administrative offices of the British Association during the forthcoming meeting will be in the Cutlers' Hall; and with the exception of Section I (physiology), which will be located in the university, all the sections will have rooms within a radius of less than a quarter of a mile from that hall. The Local Arrangements Committee is to be congratulated on having succeeded in accommodating the numerous sections within such a short distance of one another, not only because there are many members of the British Association of an eclectic turn of mind, who like to attend the proceedings of more than one section, but because, in continuation and development of a practise which demonstrates the close interrelation of the different branches of science, which has been growing in favor in the British Association in recent years, there are to be a large number of joint meetings of two or more sections for the discussion of questions of common interest. This tendency is deserving of every encouragement.

For some time past the council of the British Association has had under con-

sideration the advisability of reorganizing the work of the sections. Hitherto the sectional proceedings have mainly been devoted to the reading of individual papers on points of particular interest. This practise has served its purpose in the past, but in these days of growing specialization it is open to serious abuse, and it is a question whether the whole scheme of the association's meetings should not be revised with a view to its adaptation to modern requirements. The need is for lectures rather than papers, in which shall be set forth in as simple language as possible, for the benefit of the educated and intelligent public, who yet are not specialists, the progress that is being made in the several branches of science. Otherwise the meetings tend to become a series of provincial gatherings in which the various scientific societies assemble in extra session, repeating in holiday fashion their London proceedings. A step in the right direction reversing this tendency has been taken during the past few years by some of the sections, which have instituted afternoon lantern lectures of a semi-popular character. The holding of joint meetings between the sections for the discussion of questions of wide interest and importance is another welcome sign of appreciation of the need for adaptation to changing conditions. The endeavor which has been made in drawing up the program of the Sheffield meeting to meet this need will be apparent from the details given below of the sectional arrangements; but much remains to be done, and the question will no doubt continue to engage the attention of the council.

The meeting will open on the evening of Wednesday, August 31, in the Victoria Hall, where the retiring president, Professor Sir J. J. Thomson, F.R.S., will introduce his successor, Canon T. G. Bonney,

F.R.S., who will then deliver his presidential address. In the Victoria Hall, also, will be delivered the evening discourses to the association on the following Friday and Monday. The first of these will be by Professor William Stirling, who has selected as his subject "Types of Animal Movement," and the second by Mr. D. G. Hogarth, whose discourse will be on "New Discoveries about the Hittites." In the Saturday evening lecture to the operative classes, Mr. C. T. Heycock will deal with metallic alloys. On the evening of Thursday, September 1, the lord mayor (Lord Fitzwilliam) and Lady Fitzwilliam will hold a reception in the town hall, and later in the meeting they will entertain the association at an afternoon garden party at their seat at Wentworth. An afternoon garden party will also be given by the local committee in the Botanical Gardens, and on the evening of Tuesday, September 6, the local committee will hold a reception in the Mappin Art Gallery, on the opposite side of Western Park to the university, where simultaneously a reception will be held by the chancellor of the university (the Duke of Norfolk) and the Duchess of Norfolk. Various social functions on a smaller scale have been arranged, while members who are interested in the great metallurgical and mechanical industries for which Sheffield is famous will be afforded numerous opportunities of inspecting the leading foundries and workshops. The Saturday in the middle of the meeting will, as usual, be devoted to excursions to various places of interest in the neighborhood, including Chatsworth and Haddon Hall, Welbeck and Thoresby, Hardwick and Bolsover Castle, Clumber and Rufford.

The British Association has already accepted an invitation to hold its meeting next year at Portsmouth, and one of the

duties of the general committee at Sheffield will be to consider the place of meeting in 1912. Although it was only last year that the association went abroad to Winnipeg, it is understood that it will be invited again to leave these islands in 1912, this time for the purpose of bringing Australia within the range of its influence.² Since the association, with many misgivings and in the face of strong opposition, accepted an invitation to visit Montreal in 1884, the principle of varying its meetings in the United Kingdom by occasional flights to the oversea dominions has become firmly established. Two subsequent visits have been paid to Canada—to Toronto in 1897 and Winnipeg last year—and one to South Africa in 1905. There is no doubt that these visits serve a useful purpose in bringing colonial students into touch with the leaders of British scientific thought, and give a valuable stimulus to the pursuit of scientific knowledge in the empire oversea. Proposals that the British Association for the Advancement of Science should meet in Australia have been urged privately for many years past, but the length of the voyage and the cost of such a tour have hitherto seemed insuperable objections. Now that the commonwealth and state governments are alive to the importance of making better known the vastness of Australia's economic resources, and the many attractions it has to offer to the right class of visitor and immigrant, the financial difficulty might be partially met by official grants-in-aid.

The question of time remains a serious obstacle. At least each of the state capitals would require a visit, and the return journey could hardly be completed in less than four months. Most of the members of the

British Association are busy men, with their livings to earn, and many would be unable to spare the time for such an extended absence from this country. The attractions of the tour, however, would no doubt induce all who possibly could to make an effort to get away. Speculation as to the number is not very helpful; and with the object of giving some sure basis to go upon the council of the association has issued a circular to a number of the leading men of science in this country, requesting each to state whether, in the event of an invitation to visit Australia being received and accepted, he would be able to take part in the meeting. The result of this canvass is awaited with interest, and it must be hoped that it will justify the general committee in giving favorable consideration to the proposed invitation. The British Association is not, and can not hope again to be, the force it once was in the scientific world, but it still deserves its name as the British Parliament of Science. As a missionary agent for the advancement of scientific knowledge in the self-governing dominions of the empire it has an extended field of usefulness before it; and in these days of ever-increasing facilities for world travel Australia ought not to remain indefinitely outside the association's itinerant course.

The wide range of the association's interests and the valuable medium which its proceedings afford for the discussion of scientific questions of the day are once again shown by the program of the Sheffield meeting. Canon Bonney, the president-elect, as emeritus professor of geology in University College, London, and a former president of the Geological Society, may be expected to devote his inaugural address to the discussion of some aspect of geological science. He is perhaps best known as a student of petrology; but

² The meeting in Australia will probably be held in 1913 or 1914. In 1912 the association is likely to meet at Dundee.—ED. SCIENCE.

before he took up that branch of the subject he was an interested observer of the action of ice on the surface features of a country, and there is reason to believe that the main subject of his address will be the evidence for the work of ice and its nature in Britain and the parts of Europe that are more or less in physical relation with these islands. An ardent Alpinist, some time president of the Alpine Club, he has spent in the course of some thirty holidays considerably more than two years in the Alps, and has also visited the Pyrenees, Scandinavia and the mountainous regions of Germany, besides doing much work in the British Isles in the endeavor to determine the extent of the effects of ice action (so far as this can be determined by reasoning from observed facts) in producing or modifying the physical features of a country and the kind of materials which are signs of the former presence of ice in a country. He is specially interested in the explanations which have been proposed of the condition of the British Isles in the great ice age; and it may be conjectured that he will discuss these explanations severally, not to advocate the claims of any one, but to point out what are the strong and what are the weak points in the hypotheses that at present hold the field. Cautious observers can scarcely have failed to notice the growing tendency in recent years to treat mere hypotheses as if they were axiomatic truths established by indubitable observations, and as if they afforded a safe basis for reasoning. Professor Bonney is known to be opposed to such methods; and it may be surmised that he will seek to winnow out some of the chaff of fancy from the grain of fact, and to bring into clear relief the difficulties with which the advocate of any one view of the condition of these islands during the ice age has to contend. He himself, it

is understood, is not yet prepared to pronounce a definite opinion on the subject, taking as he does the view that there is more to learn before a decision can be reached.

For the following particulars of the sectional programs we are indebted to the sectional presidents and recorders.

The president of Section A (mathematical and physical science) is Professor E. W. Hobson, F.R.S. His presidential address will consist of some remarks on the scope and aims of modern mathematics, with some observations on the relations between mathematicians and physicists. The address will also contain some discussion of recent changes in the teaching of the more elementary parts of mathematics. In the subsequent proceedings of Section A importance attaches to the joint meetings which have been arranged with other sections. In one of these, to be held jointly with Section B (chemistry) and G (engineering) on the morning of Friday, September 2, the report of the Gaseous Explosions Committee will be discussed, and a number of papers dealing with combustion will be presented for consideration. The section will again meet jointly with Section G on the following Monday, when Professor G. H. Bryan, F.R.S., will open a discussion of great topical interest and importance on "The Principles of Mechanical Flight." On the Tuesday the section is to discuss some of the problems of Atmospheric Electricity, the opener being Dr. C. Chree.

In his presidential address to Section B (chemistry) Mr. J. E. Stead, F.R.S., will deal with the chemical phenomena connected with the effect of sulphur and silicon on the carbon condition in commercial cast iron. After reviewing the work of others in this connection, he will state the results of much of his own original re-

search work, which go far to explain why it is that sulphur in cast iron tends to make it white, and why silicon tends in the opposite direction. Reference has already been made to the meeting which the section will hold jointly with the Sections A and G on Friday, September 2. The following Monday morning will be devoted to a joint meeting with Section I (physiology) and K (botany), for the purpose of a discussion on the subject of the "Bio-chemistry of Respiration"; while in the afternoon the "Neglect of Science by Commerce and Industry" will be considered in conjunction with Section L (educational science). The sitting of Tuesday, September 6, it is proposed to devote to the consideration of papers of a metallurgical interest. Contributions to this day's proceedings have been promised by Professor Arnold, F.R.S., on "A Fourth Recalescence in Steel"; Professor McWilliam on "The Influence of Chemical Composition and Thermal Treatment on the Properties of Steels"; Dr. S. Monckton Copeman, F.R.S., on "Ferro-Silicon"; Dr. S. N. Friend, on "The Corrosion of Iron and Steel"; Dr. Rosenhaim, and Professor Howe.

Professor H. E. Armstrong hopes to contribute a paper on "The Provident Use of Coal," in which he will raise the important question of using coal in such a way that the valuable constituents—gas, volatile substances, pitch, coke—are all, as far as possible, got out of it. This is a problem of national importance, and it will be interesting to see how far Professor Armstrong is able to advance its practical solution. Two reports will be presented to the section, one on "Combustion" by Professor Bone, F.R.S., and the other on "Solubility," by Dr. S. V. Eyre. Professor Bone will also describe and demonstrate a new method of heating by gaseous combustion, and its industrial application. The report

and demonstration will be especially interesting in connection with the joint meeting for the discussion of such questions with the physicists and engineers. From the Sheffield University Chemical Laboratory papers in organic chemistry have been promised by Professor Wynne, F.R.S., and Dr. S. F. Thorpe, F.R.S., and in physical chemistry by Mr. W. E. S. Turner and others.

Mr. A. D. Hall, F.R.S., director of the Rothamsted Experimental Station of the Lawes Agricultural Trust, is this year chairman of the agricultural subsection, which is attached to Section B. He will devote his chairman's address to a history of opinions as to the causes of the fertility of the soil. After allusion to the men of the seventeenth century—Kenelm Digby and Evelyn—who fixed on the niter of the soil as the source of its fertility, he will proceed to the early nineteenth century, when the first exact knowledge of the nutrition of the plant was obtained. This will lead to the chemical theory of the soil with Daubeny's distinction between dormant and active plant food, and the more recent developments of such a theory. The breakdown of this hypothesis led to another theory that regarded all soils as possessing an excess of plant food, their behavior towards water being the factor which made them fertile or unfertile. A development of this latter theory has been to regard plants as excreting toxins injurious to themselves, so that an unfertile soil is one laden with the products of the previous growth of the same class of plants. With the discovery of bacteria in the soil a theory grew up which regarded fertility as due to the rate at which the soil could produce nitrates; a later development of this theory has arisen through the discovery in the soil of protozoa, which by keeping down the number of bacteria limit the

production of available nitrogen compounds, and therefore the fertility. The conclusion reached by Mr. Hall is that no one factor can be found which determines fertility; it must be taken as the resultant of many and often conflicting actions.

As is the case with so many other sections this year, joint meetings with the representatives of other branches of science form a prominent feature in the program of the agriculturists. The object is to obtain outside suggestions and criticisms on questions that are now assuming considerable importance in agricultural research. Thus the question of magnitude of error in an agricultural experiment will be discussed in conjunction with Section F (economic science and statistics), papers being contributed by Messrs H. E. Armstrong, T. B. Wood, A. B. Bruce, R. W. Berry, S. H. Collins, A. D. Hall and E. J. Russell; the question of soil surveys in conjunction with Section C (geology), papers being promised from the Rothamsted, Bristol and Cambridge laboratories; and the question of the effect of organisms other than bacteria on soil fertility in conjunction with Section D (zoology), papers by Dr. E. J. Russell and Mr. W. B. Hutchinson. Probably the most popular subject for discussion will be the growth of sugar beet in England, on which papers have been promised by Mr. G. L. Courthope and Mr. Sigmund Stein. Some recent phases of the problem of nitrogen fixation by bacteria will be discussed by Professor Bottomley and Mr. John Golding. Among individual papers, as distinct from contributions to general discussions, may be mentioned "Scientific Breeding of Live Stock," by Mr. K. J. J. Mackenzie, of Cambridge; "Effect of Town Atmosphere on Vegetation," by Dr. Crowther, of Leeds; "A Bacterial Disease of Potatoes," by Mr. A. Howe, of Armstrong College, Newcastle-

on-Tyne; and "Costs of Danish Farming," by Mr. Christopher Turnour.

The program of Section C (geology) has been arranged in some detail. Four papers are announced for Thursday, September 1, before the delivery of Dr. A. P. Coleman's presidential address. These are "The Yordale Series and its Equivalents Elsewhere," by Mr. Cosmo Johns; "The Paleozoic Rocks of Cantley (Sedbergh)," by Dr. J. E. Marr, F.R.S., and Mr. W. G. Fearnside; "The Graptolitic Zones of the Salopian Rocks of the Cantley Area (Sedbergh)," by Miss G. R. Watney and Miss E. G. Welch; and "Pleochroic Halos," by Professor J. Joly, F.R.S. After the presidential address papers will be read by Dr. C. H. Lees, F.R.S., on "Mountain Temperatures and Radium"; Mr. F. D. Falconer, "Outlines of the Geology of Northern Nigeria"; Mr. W. Parkinson, "Notes on the Geology of the Gold Coast"; and Mr. Cosmo Johns, "The Geological Significance of the Nickel-Iron Meteorites." Friday's proceedings will be devoted to joint discussions with Section E (geography) on various subjects of local interest. There will first be a discussion on the geography and geology of the Sheffield district, to which contributions have been promised by Mr. Cosmo Johns ("The Local Geology"), Mr. H. Culpin ("The Marine Bands in the Coal Measures of South Yorkshire"), and Mr. W. H. Dyson ("The Maltby Deep Boring"). This will be followed by a discussion on the economic products of Sheffield as affected by the structure of the district. In this connection Professor A. McWilliam is expected to read a paper on "The Metallurgical Industries in Relation to the Rocks of the District." The remainder of the day's proceedings will be devoted to the consideration of regional surveys. Papers have been promised by Mr. T. Sheppard, on "The Humber during

the Human Period," and Mr. O. Crawford, on "The Andover Region." For Monday, September 5, papers are announced on "Thrust Masses in the Western District of the Dolomites," by Dr. W. M. Ogilvie-Gordon; "The Geology of Cyrenaica," by Professor J. W. Gregory, F.R.S., and "The Geology of Natal," by Dr. F. H. Hatch. Dr. John Milne, F.R.S., will present the report of the seismological committee, and the closing part of the sitting will be devoted to the joint discussion with the agricultural subsection on "Soil Surveys," to which reference has already been made. Tuesday's proceedings will include two short lantern lectures by Dr. Tempest Anderson, one entitled "Kilauea and its Lessons," and the other, "Some Volcanic Phenomena in New Zealand." There is also announced what should be an important discussion on the concealed coalfield of Nottinghamshire, Derbyshire and Yorkshire, the openers of which will be Professor P. F. Kendall and Dr. Walcot Gibson.

One of the most interesting features in the proceedings of Section D (zoology) will be an afternoon lantern lecture by Dr. Hans Gadow, F.R.S., on "Coral Snakes and Peacocks." Reference has already been made to the joint meetings arranged with the agriculturists for the discussion of some of the problems of soil fertility. Other papers have been promised by Professor Marcus Hartog, on "Mitokinatism and the Electro-colloid Hypothesis"; by Professor C. J. Patten, on "Semination in *Calidris Aronaria*," a key to some of the problems regarding its migratory movements during the breeding season; by Professor Garstang, on "Some Experiments and Observations on the Colors of Insect Larvæ"; by Dr. Edward Hindle, on "A Cytological Study of Artificial Parthenogenesis"; by Dr. H. B. Fantham, on

"Avian Coccidiosis"; by Dr. Jenkinson, on "Relation of Regenerated and Developmental Processes"; by Dr. E. H. J. Schuster, on "First Results from the Oxford Anthropometrical Laboratory"; and by Dr. H. W. Marett Tims on "Development of the Pectoral Girdle in *Acanthias vulgaris*."

The president of Section E (geography) is Professor A. J. Herbertson, of Oxford. In his presidential address he proposes, after a brief review of the progress of geography during the past ten years, especially educational progress, to attempt to elucidate the scope and functions of geography, about which there are many misconceptions. He will also discuss the future of geography, more particularly as a subject of research, in its bearings on practical questions. The special feature of the sectional proceedings, apart from the president's address, will be the joint meeting with the geological section, already alluded to. Among papers of varied interest that have been promised, mention may be made of an account by Colonel R. T. Bright, of the new Uganda-Congo Frontier; a discussion of the problems of the Nile Alluvium, by Captain H. G. Lyons; a description by Dr. W. S. Bruce, of Prince Charles Foreland, Spitzbergen, and an account by Captain Davies, of the Voyage of the *Nimrod*. Mr. J. W. Hayward, of Montreal, will contribute a paper on "The Cattle District of Queensland," and Mr. J. W. Falconer one on "The Rivers of Northern Nigeria," while nearer home, the Mitchelstown Caves and the underground waters of the Castleton District will be described by Mr. C. A. Hill and Mr. H. Brodrick respectively.

In his presidential address to Section F (economic science and statistics) Sir H. Llewellyn Smith will deal with various aspects of recent tendencies of economic

thought and research, both as regards the methods employed and the ultimate objects sought. In regard to the latter point particular stress will be laid on the growing tendency to attach importance to the study of ends as distinct from means. In illustration of this point reference will be made to the increasing importance attached to economic security as an end to be consciously pursued—a tendency which finds expression in the vast modern developments in the method of insurance. An attempt will be made to find criteria for determining how far and in what sense and within what limitations this tendency is a healthy one. As a particular example the question will be discussed how far the risks of unemployment can properly be regarded as insurable risks, having regard to the criteria laid down, and how far it is possible and expedient to apply the method of insurance to some or all of these risks. This discussion will lead to the formulation of certain principles which suffice to determine, within comparatively narrow limits, the lines and scope of any economically practicable scheme for insurance against unemployment.

Professor W. E. Dalby, dean of the City and Guilds Central Technical College, who is this year president of Section G (engineering), will devote his address to the consideration of various questions relating to British railways. Of much interest and importance in the general proceedings of the section will probably be the joint discussion with the mathematical and physical science section on aerial flight, and the joint discussion with the chemical section on combustion. The report of the Gaseous Explosions Committee will also come up for consideration. Separate papers have been promised by Professor Ripper on "The Testing of the Lathe Tool Steels" and "A New Method of Testing

the Cutting Quality of Files"; Mr. W. A. Scoble, "Experiments on Aeroplanes"; Mr. H. S. Wimperis, "Accelerometers"; Professor Coker, "Optical Determination of Stress"; Professor S. P. Thompson, F.R.S., "Laws of Electro-mechanics"; Mr. Philip Dawson, the "Electrification of the Brighton Railway," and Mr. F. Bacon, "Heat Insulation."

In his presidential address before Section H (anthropology) Mr. W. Crooke intends to discuss the possibility of improving, by a course of anthropological training before they join their appointments, the qualifications of young officers appointed to the Indian and Colonial services. As a development of this the future organization of ethnographical surveys throughout the empire under the control of experts will receive consideration. Assuming that such a course is applied to India, Mr. Crooke will discuss certain questions which are not likely to be solved by any other method, such as the relation of the present population to the prehistoric culture of the country, and the origin and development of the distribution of caste.

A large number of descriptive papers will, as usual, be presented to the section; but perhaps the most noteworthy feature of the program is the devotion of the Friday sitting to a joint discussion with Section L (educational science) on "Certain Aspects of Educational Research." On behalf of Section L, Professor J. A. Green, of Sheffield, the secretary of a committee which has been investigating the mental and physical factors involved in education, will present a report on the present position of educational research at home and abroad. Dr. Gray will also present a report on behalf of a committee of the Anthropological Section on methods of observing and measuring mental characters. It is hoped that Professor Münster-

berg, of Harvard, will open the discussion, in which Dr. Lucy Hirsch Ernst, Professor Lippman, of Berlin, Dr. Kerr, the principal medical officer of the London County Council, and several members of his staff, Professor C. S. Myers, Dr. T. P. Nunn, Dr. Rivers, of Cambridge, and others, have signified their intention to take part. Reports will be presented by the investigators, of serial observations on school children and others, which have been conducted in London, Liverpool, Sheffield, Wolverhampton and elsewhere.

Apart from the joint discussion with the chemical and botanical sections on "The Biochemistry of Respiration," the provincial arrangements of Section I (physiology) include a joint discussion with the educational section on voice production. There will further be a discussion on caisson disease, to be opened by Dr. Leonard Hill, F.R.S., while Professor C. S. Sherrington, F.R.S., has promised a paper on "Reflex Standing and Walking."

In Section K (botany) the papers are generally distinguished by their severely technical character. The program of the section for the Sheffield meeting forms no exception to the rule; but, as in former years, the proceedings will be relieved on one afternoon by a semi-popular lecture. This will be delivered by Professor F. O. Bower, who has chosen the attractive title, "Sand Dunes and Golf Links." Papers have also been promised by Professor Bower (a) on "Two Synthetic Genera of Filicales"; (b) "Note on *Ophioglossum palmatum*"; by Dr. F. Darwin, on a new method of estimating the opening of stomata; Mr. S. Maugham, the "Paths of Translocations of Sugars from Green Leaves"; Professor F. W. Oliver, on the "Pollen Chambers of Fossil and Recent Seeds"; Mrs. Thoday, the "Morphology of the Ovules in *Gnetum* and *Welwitschia*";

Dr. M. C. Stopes, "Further Observations on the Fossil Flower"; Mr. Harold Wager, "Chromosome Reduction in the Hymenomyces"; Professor V. H. Blackburn, on the "Sexuality of *Polystigma rubrum*"; Professor Farmer and Miss Digby, on "Telophases and Prophases in *Galtonia*"; Dr. Lloyd Williams, the "Zoospores and Trumpet-hyphæ of the Laminariaceæ"; Mr. M. Wilson, "Plant Distribution in the Woods of Northeast Kent"; Mr. A. S. Horne, on the "Absorption of Water by Leguminous Seeds"; Dr. H. C. J. Fraser is also contributing a cytological paper. Mention has already been made of the joint discussion with the chemists and physiologists on the biochemistry of respiration.

As president of Section L (educational science), Principal H. A. Miers, F.R.S., will take as the subject of his inaugural address "A Distinction between University and School Methods of Education." In it he will suggest that many of the present failures of our educational system are due to the fact that university methods are too often used at school and that school methods are too often retained at the university; that at the university preparatory work should no longer be required, but that the student should be brought into an atmosphere of inquiry, in which he is from the very beginning made to feel responsible for his work. He will urge that this change of method should be sudden and complete, and preparatory courses of training should be entirely abandoned, and that the method of teaching a trained mind should be entirely different from that which is employed with the untrained minds of children. The Educational Section has always aimed at confining its proceedings mainly to the discussion of questions of wide interest and outstanding importance, and this year it has managed its full share of joint meetings with other sections. The arrange-

ments for the meeting with the anthropologists for the discussion of questions of educational research have been described under Section H.

The joint discussion with the chemistry section on the neglect of science in commerce and industry will be opened by Mr. R. Blair, the Education Officer of the London County Council, and Professor Bovey, F.R.S., Principal E. H. Griffiths, F.R.S., Sir William Tilden, F.R.S., and others have promised to take part. This will be in the afternoon of Monday, September 5.

The joint meeting of the physiologists for the discussion of voice production will occupy the afternoon of the following day, and papers have been promised by Dr. A. A. Gray, Principal Barrell, of Isleworth, Professor Wesley Mills, Mr. W. H. Griffiths and Miss Ormée, of Sheffield. Within the section itself will be discussions on hand-work and science in elementary schools, to be opened by Mr. J. G. Legge, director of education in Liverpool; and open-air studies in schools of normal type, to which contributions have been promised by Mr. J. E. Feasey, of Sheffield, Mr. G. G. Lewis, of Kentish Town, and Professor Mark R. Wright, of Newcastle-on-Tyne ("A Training College under Canvas").

In accordance with the usual practise, visits to schools and other educational institutions of interest will be arranged during the meeting.

THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS

THE twenty-seventh convention of the Association of Official Agricultural Chemists will be held in Washington, D. C., at the Raleigh Hotel, opening on November 10, at 9 o'clock. As the hotel will provide a large hall on the top floor of the building for the convention, as well as other facilities for the meeting, it is urged that the members make the Raleigh their headquarters, if possible, and reserve their rooms a few days in advance.

ORDER OF BUSINESS

Thursday, November 10.

Morning session: Phosphoric acid; Nitrogen; Potash; Soils; Inorganic plant constituents.

Afternoon session: Appointment of committees (resolutions, etc.); Insecticides; Water; Committee A on recommendations of referees; reports of special committees—(amendments to constitution; appropriation; availability of phosphoric acid; compilation of by-laws; food standards; unification of terms; standardization of alcohol tables; testing of chemical reagents; unification of methods of analysis of fats and oils).

Friday, November 11.

Morning session: Food adulteration (reports to be called for in order given in list of associate referees).

President's address (special order for 12 o'clock).

Afternoon session: Food adulteration continued. Separation of nitrogenous bodies (meat proteids; milk and cheese proteids; vegetable proteids). Committee C on recommendations of referees.

Saturday, November 12.

Morning session: Dairy products; foods and feeding stuffs; Sugar (chemical methods and molasses methods); Committee B on recommendations of referees; committees (resolutions, constitution, etc.); Tannin.

Afternoon session: Drugs and medicinal plants.

H. W. WILEY,
Secretary

WASHINGTON, D. C.,
August 13, 1909

SCIENTIFIC NOTES AND NEWS

PROFESSOR EDWARD C. PICKERING, director of the Harvard Observatory, was reelected president of the Astronomical and Astrophysical Society of America at the meeting held in Cambridge on August 19. The other officers of the society, also reelected for the ensuing year, are: *First Vice-president*, George C. Comstock, University of Wisconsin; *Second Vice-president*, W. W. Campbell, director of